

REMARKS

Claims 29, 32, 34-39, 43-53, 56, and 57 are pending. Claims 29, 32, and 34 have been canceled. Claims 37 and 43-53 have been withdrawn from consideration. Claims 35, 36, 38, 39 and 56 have been amended, and new claim 58 has been added. Basis for the claim amendments is at specification page 11, lines 15-23 and in Figs 1-3, page 15, line 28 – page 16, line 21 and in the patent application (now patent 6,878,419) incorporated by reference at page 15, lines 30-32 (see column 7, lines 12-19 of the patent). The amendment to the specification replaces the patent application mentioned at the bottom of specification page 15 with the number of the US patent based upon that application.

The Examiner kindly granted an interview which was held February 24, 2006 in her office. Proposed claim amendments were reviewed during the interview. The claim amendments and the remarks which follow reflect the substance of the interview and are intended to fulfill the requirement for a written statement.

In paragraphs 3 and 4 of the Office Action, claims 29, 32, 34-36, 38, 39, 56, and 57 have been provisionally rejected on the ground of non-statutory obviousness-type double-patenting over U.S. Serial Nos. 10/437,799 and 10/438,090. Serial No. 10/438,090 has issued as U.S. Patent 6,986,428. Enclosed with this Amendment is a Terminal Disclaimer disclaiming the term of any patent issuing on this application beyond the term of both U.S. Patent 6,986,428 and any patent issuing on Serial No. 10/437,799. The rejections of paragraphs 3 and 4 in the Office Action should be withdrawn.

Claims 29, 32, and 34-36 stand rejected under 35 USC § 112, second paragraph. This rejection is moot as to canceled claims 29, 32 and 34. As to the remaining claims, it has been avoided by the amendment to claim 36. Claim 36 now states that the ends of the walls (on the base of the gas delivery layer b) are attached to the gas permeable, water impermeable layer (layer a). Thus, the walls arise from the base and are attached to layer b, and the spatial relationship of the claim elements is definite.

Claims 29, 34, 35, and 38 stand rejected under 35 USC § 103(a) as being unpatentable over WO 99/65595 in view of Degen et al. (US 4,954,256). This rejection is traversed as to claims 35 and 38. Reference will be made to U.S. Patent 6,514,412 (Insley) instead of WO 99/65595, as the Examiner has done.

In order to arrive at the invention of amended claims 38 and 35 from the disclosures of Insley '412 and Degen, one would have to modify the teachings of the references by adding the feature that the gas permeable, water impermeable layer of part a is oleophobic or has improved oleophobicity by virtue of fluorochemical additives within the composition of the gas permeable, water impermeable layer. Neither reference teaches such means for enhancing oleophobicity in a microporous membrane. Degen teaches a hydrophobic, microporous membrane having bonded to the surface a fluoropolymer; however, claim 38 has been amended by canceling former part i specifying a coating of fluorochemical or fluoropolymer. Since the combination of Insley '412 with Degen, even if made, would not have all required features of amended claim 38, that claim, and claim 35 which depends from claim 38, are not obvious from the combination.

Claim 56 stands rejected under 35 USC § 103(a) as being unpatentable over WO 99/65593 in view of Degen (US 4,954,256) and Kulprathipanja (US 5,127,925). This rejection is traversed. It is believed that the Examiner intended to cite WO 99/65595 instead of WO 99/65593 in Office Action paragraph 10 (it refers to Insley '412 which corresponds to WO 99/65595), and it is presumed that WO 99/65595 was the reference used (as in Office Action paragraph 9).

Claim 56 requires a microbial support layer located on the side of the gas permeable, water impermeable layer of part a opposite the gas delivery layer, said microbial support layer being characterized as hydrophilic (or having increased hydrophilicity) by a means selected from i.-iv. The recitation of being loaded with a filler such as activated carbon has been canceled from claim 56, eliminating the reason for citing Kulprathipanja. In order to arrive at rejected claim 56 by combining the three cited references, one must add to the disclosures of Insley '412 and Degen a microbial support layer which has been made hydrophilic by one of the means specified in claim 56, part c., none of which are found in the references.

Claims 32 and 39 stand rejected under 35 USC § 103(a) as being unpatentable over WO 99/65595 in view of Degen et al. (US 4,954,256) and further in view of WO 99/65593. This rejection is traversed as to claim 39. I will refer to Insley U.S. Patent 6,524,488 instead of WO 99/65593, as the Examiner had done in her Office Action of March 22, 2005 (paragraph 12). Claim 39 has been amended to depend from amended claim 38, and thus incorporates all limitations of claim 38.

The combination of Insley '412 with Degen and Insley '488 lacks disclosure of a gas permeable, water impermeable, microporous membrane that is oleophobic because of having fluorochemical additives within the composition of the gas permeable, water impermeable layer as specified in amended claim 38. Nothing in the three cited patents would lead one to modify the microporous separation media 62 of Insley '412 by the means now specified in amended claim 38.

Insley '488 has nothing to do with the layered sheet constructions of claims 38/39. Insley '488 teaches filtration media in which air flows through stacked layers 12 with channels 25. Insley '488 discloses a depth-bed filter for use in such articles as respirator masks (col. 3, ll. 28, col., 6, ll. 45-60, col. 11, ll. 1-23, and Fig. 13). There is no microporous, air permeable, water impermeable layer and no suggestion to combine his stacked structured surfaces with one.

In Office Action paragraph 12, claims 29, 34, 35, and 38 stand rejected under 35 USC § 103(a) as being unpatentable over WO 99/65595 in view of Wang et al. (US 6,355,081). This rejection has been avoided as to claims 35 and 38. Claim 35 has been amended to depend from claim 38.

Although polydimethylsiloxane coatings are disclosed in Wang as a means for imparting oleophobicity to porous polymeric filter membranes, they have been cancelled from amended claim 38. The only means remaining in claim 38 for making microporous layer a. oleophobic is fluorochemical additives within the composition of the gas permeable, water impermeable layer which is disclosed in neither Wang or Insley '412. Even if Wang were combined with Insley '412, an important feature of amended claim 38 and 35 would be missing.

Claim 56 stands rejected under 35 USC § 103(a) as being unpatentable over WO 99/65593 (Insley '488) in view of Wang and Kulprathipanja. This rejection has been avoided.

Insley '488 teaches filtration media in which fluid (e.g., air) flows through stacked layers 12 with channels 25 for filtration. There is no air permeable, water impermeable microporous layer in Insley '488. In Insley '488, the fluid (e.g., air) to be filtered passes through the channels, which are orthogonal to the face of the filter which comprises the ends of the stacked layers 12 with structured surfaces (see Figs. 1-6 and 10-11, column 1, lines 41-47, col. 11, ll. 1-23 and claim 1 of Insley '488). In the present invention, gas flows through flow channels but changes direction to flow out through the gas permeable, water impermeable layer and the microbial

support layer to feed bacteria growing on the outside. There is no such change in flow direction in Insley '488.

In addition to the points raised regarding Kulprathipanja above, it is noteworthy that, at least in his examples, he needs substantial upstream pressure (1034 kPa in Examples II – V) to force gases through his membrane; whereas no large pressure difference is needed to cause air to flow through the presently claimed membranes to bacteria growing on the outside. Such high pressure gas would be antithetical to the purpose of feeding a microbial population without removing it from the microbial support layer.

Although Wang teaches a microporous vent filter for medical devices comprising oleophobic, hydrophobic substrate, he is missing the gas delivery layer, microbial support layer and the means for rendering the microbial support layer hydrophilic specified in claim 56.

It would require hindsight to use the teachings of the three cited references in order to arrive at the invention of amended claim 56.

New claim 58, which limits the microbial support layer to one that has been treated by a process exposing the membrane to an ion sheath of a plasma and which has oxygen, nitrogen, silicon, carbon, hydrogen sulfur or combinations thereof bonded to the pores, is further distinguished from the cited. None of the references discloses such a means for rendering a membrane hydrophilic.

Claims 32 and 39 stand rejected under 35 USC § 103(a) as being unpatentable over WO 99/65595 in view of Wang et al. (US 6,355,081) and further in view of WO 99/65593. This rejection is moot as to cancelled claim 39 and is traversed as to amended claim 39 which now depends from claim 38.

Although Wang adds a polydimethylsiloxane coating to a microporous filtration membrane, claim 38 has been amended by canceling recitation of polydimethylsiloxane as a coating on microporous layer a. The reasons given for nonobviousness of claim 38 over this combination of references already discussed above (with regard to Office Action paragraph 12) apply to this rejection of claim 39.

In the Office Action dated May 15, 2003, paragraph 2, the Examiner reminded applicants of the right to request rejoinder of method claims with product claims upon indication of the product claims being allowable. Applicants have amended process claims 37 and 53 to depend from claims 36 and 56. Process claims 37, 43 and 53 now all depend from product claims that

the Examiner has indicated are allowable as currently amended. Accordingly, applicants request rejoinder of claims 37, 43 and 53.

In view of the above discussion, it is respectfully submitted that claims 35 – 39, 43 and 56-58, as amended, are in condition for allowance. Withdrawal of the rejections under 35 U.S.C. 112 and 103 is requested and a notification of allowability is respectfully solicited. If any issues or questions remain the resolution of which the Examiner feels would be advanced by a conference with Applicants' attorney, she is invited to contact such attorney at the telephone number noted below.

Respectfully submitted,

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Date

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